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ABSTRACT

In order to determine the extent of loss due to theft of books and bound journals from the main stacks of Doe Library, three types of inventories were conducted: a volume count, an item-by-item inventory of the D-classed materials, and three sample inventories. Depending on certain assumptions, the results show that losses could range as high as 4.46 percent and that there is strong evidence of an increasing rate of theft. Recommendations for improving methodology in a proposed follow-up to this study are provided, as well as tables presenting the collected data. Appended are the results of the loan department service survey, a draft proposal for measuring the level of theft from the main stacks of Doe Library, and the code book for those who desire to obtain in machine-readable form the data collected in the sample inventories. (JD)

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A REPORT ON THE LEVEL AND RATE OF BOOK THEFT FROM THE MAIN STACKS OF THE DOE LIBRARY AT THE UNIVERSITY OF CALIFORNIA, BERKELEY

by

Neal K. Kaske

with the assistance of

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Library Systems Office
The General Library
University of California, Berkeley
March 1977

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Kenneth Legg, Head of the Circulation Department, is thanked for hosting the study, helping in managing the project, and for his critical reading of the report. The author is also indebted to Susan Martin and Walter Crawford of the Library Systems Office for their expert editorial work. Sincere thanks are extended to the many student library employees who helped in collecting the data for this study. Without the help, advice, and cooperation of all of these people, this project would not have been possible.

INTRODUCTION

Problem Statement

Planning security measures to prevent loss of library materials can only be informed if the extent of such loss is known. The extent of loss due to theft of books and bound journals from the Main Stack of the Doe Library is not known. The last complete inventory took place during the 1940's, and even the results of that inventory are no longer available.

Prior to this project, there have been three sources of information on book loss in the main stacks: a Service Survey conducted by the (then) Loan Department in 1969, a small trial stack inventory conducted in 1972, and the ongoing work of the Acquisition Department in replacing lost books.

The results of the 1972 inventory, carried out informally to develop cost estimates for a full inventory, were never reported in detail.[1] The 1969 survey took every request for Loan Stack material over one academic quarter and determined why each unfilled request was not filled; the results appear in tabular form in Appendix A. These results parallel those of this project to some extent. However, the 1969 Service Survey was a comprehensive study of items *demanded*; this project considers a random sample of *all theoretically available* items.

1. The unreported loss rate ranged from 1.5% to 3.3% in the areas studied. These percentages are not directly comparable to those in the current project.

The Acquisition Department searches materials reported missing from the Main Stacks; such reports come only after a series of four thorough searches. After the final search, selectors may choose to replace or withdraw the missing items. The following table shows recent results of this process, given an estimate of $20.00 per lost item (which does not include the cost of processing):

	Oct-Jan 1973-74	Jul-Jun 1974-75	Jul-Jun 1975-76
Number of replacements ordered	928	1,369	1,343
Number of copies withdrawn	355	391	499
Total of missing items	1,283	1,760	1,842
Estimated loss	$25,660	$35,200	$36,840

Opinions, in and out of the Circulation Department, vary greatly as to the amount of loss due to theft.[2] This project attempts to estimate that loss, and provides a methodology for making a meaningful estimate of loss rate. A search of current literature did not provide a sound methodology for measuring loss rate; thus, this project provides a small breakthrough in estimating rate of book losses.

2. Here and throughout this report, losses not otherwise explainable are assumed to represent theft.

Background

The Librarian's Office requested a proposal in late spring 1976 for measurement of theft rate from the Main Stacks. This proposal, prepared by the Circulation Department and Library Systems Office, was accepted.[3] Lack of time and money prevented completion of the full project as proposed.

Data was gathered in June 1976, continuing into the summer. Results were coded and converted to machine-readable form, and analysis continued into fall and winter 1976.

The project included a full volume count of Main Stack holdings, a full inventory of portions of "D" class (History), and three sample inventories of the Main collection. Methods used are described in the next section. Variations from the project proposal are those of scale and resulted from lack of time and money.

---

3. The proposal is included as Appendix B.

Setting

The Main Library collection is divided between a nine-tier stack ("Main Stacks") on the Berkeley campus and a remote storage facility ("ICLF(N)", or Inter-Campus Library Facility (North)) in Richmond, California. Faculty, graduate students, and some University staff and undergraduates have access to the stack; all other patrons request materials, which are paged for them.

Most books are charged at the stack exit (between 66% and 80% of all circulation). While briefcases, large bags, and packs are checked at this point, there is no electronic security system to detect concealed books. All other exits from the main stacks either have fire alarms or require passing through staff work areas.

METHODOLOGY

Volume Count

The purpose of the volume count was to learn the size of the collection, expressed in physical volumes. While size tables are maintained for the collection, the most recent physical count of the Loan Department collection took place in 1972. Differences in definitions and problems in data collection raise doubts as to the long-term accuracy of the volume count without redoing the actual, physical, count.

The proposal calls for two full counts, one in May-June 1976 and another a year later. The second count is not part of this project but would provide data on loss during fiscal 1976/77.

The method used to determine the actual volumes in each LC classification (A,B,C, etc.) was similar to that used in 1970 and 1972:

1. Physical volumes in the class were counted: on the normal shelves, book return and stack shift shelves, hold and recall shelves, and bindery shelf;
2. Immediately after this count, charge cards for the class were machine-counted;
3. The Loan Department ICLF(N) shelflist was counted for the class.

The data from the ICLF(N) count, the stack count, and the tally of items from the machine count of the charge cards were then added together. Charge cards were counted immediately after completing the physical counting, to minimize the possibility of duplicate counting. However, the file count does include branch holdings of Circulation Department books.

The results of these counts are given in the next chapter.

This part of the project will only help in assessing loss rate if the second count, in May-June 1977, is done. The count should be accurate within 3%, assuming normal clerical error.

D Inventory

Since there was not time or money to inventory the full D classification, the first three subclasses (D, DA, and DB) were inventoried, with the heavily-used subclass DT added; losses in subclass DT were expected to be large.

The inventory began with a comparison of the shelf list with materials on shelf or in the circulation file. The step-by-step process for each title follows:

1. Check the shelving location. If all volumes are present, proceed to the next title. If not, write the call number on a 3x5 slip.

2. Check the slips against the following locations, discarding slips as items are found:
   a. The circulation and ICLF(N) files;
   b. The hold and return shelves;
   c. Recheck the shelving location.

3. Recheck the remaining slips in the shelf list. Fill out search forms for remaining slips, and record the items as missing.

This process was followed for monographs and serials. Dead serials, those showing complete holdings and lacking the statements below, were treated as multi-volume monographs. Otherwise, serials were identified for this inventory by the presence of one or more of these statements on the shelf list card:

For issues not recorded here inquire at Periodical Desk
[or Documents Department]

Information about holdings available at Periodical Desk

For volumes in Library see Author Catalog

Holdings for these serials were determined from Serials Department rotary files, dead files, and microfiche, Documents Department

area and rotary files, and the Catalog Department's Central Serial Record (CSR). It was not always possible to determine the number of bound volumes, as entering cards do not show how material was bound.

This method of comparing shelf list records with actual holdings facilitates reporting of two types of problems:

1) volumes are listed in the shelf list but missing from their place in the collection, and not accounted for in the circulation files;
2) volumes are present on the shelf but not listed in the shelf list as being part of the collection.

The first problem could result from six causes:

1) volumes are misshelved in the stacks;
2) volumes are misshelved in a branch library;
3) shelf list cards are misfiled;
4) shelf list cards contain incorrect call numbers;
5) shelf list records have not been updated to reflect transfers;
6) volumes have been stolen.[4]

The second problem could result from three causes:

1) the volume is mislabelled;
2) the shelf list cards are misfiled;
3) the volume does not belong in the Loan Stacks.

As problems were uncovered in the inventory they were dealt with and, in some cases, counted; the results are tabulated. The inventory and first search was completed and tabulated by October 1976; a second search of missing volumes was completed by February 1977. Results are shown in the next chapter.

4. Again: "stolen" is used to cover any unexplainable loss or absence.

Sample Inventories: A. Drawing the Samples

Three inventories were made of Loan Stack materials, based on random samples of the shelf list and of cards not yet filed into the shelf list or removed from the shelf list for processing materials into storage.

The first sample was taken from data collected by the Institute of Library Reserach for a study reported by Charles P. Bourne, report number ILR 75-006, *Planning Data for the Conversion of UCUCS-2 Catalog Card Records into Machine Readable Form (UCUCS-2 Conversion Planning)*, January 1976.

> UCUCS-2 consists of cards for all cataloging on the nine UC campuses from 1968 to 1972. These cards were sent to the University-wide Library Automation Project. ILR drew a stratified random sample of those cards, and photocopied the selected 3x5" cards on 8 1/2 x 11" sheets, three cards to a sheet, with coding forms alongside.
>
> For this study, copies of the ILR sheets were obtained. The card images for Berkeley records without branch shelving locations - 520 out of the 1134 Berkeley records - were cut from the sheets and attached to the search form used for all three inventories. The actual inventory and search was performed identically to the other two.

The other two inventories used stratified random samples from the Loan Stack shelf list (and other cards as noted above).

> To obtain a stratified random sample, it is first necessary to decide on a desired confidence level and interval [5] and determine the size of the universe from which the sample will be drawn.
>
> The size of the universe - the cards in the shelf list - was determined by compressing and measuring cards, taking 100 cards per inch as a standard. [Measurements were done in centimeters and converted.][6] Guide cards were counted and subtracted from the total:
>
> $$\frac{\text{total cm} \times 100}{2.54 \text{ cm/inch}} - \text{number of guide cards} = \text{number of cards}$$
>
> $$\frac{26{,}673.5\text{cm} \times 100}{2.54} - 13{,}447 = \text{number of cards}$$
>
> $$1{,}050{,}138 - 13{,}447 = 1{,}036{,}691 \text{ cards}$$
>
> A confidence level of 95% with an interval of ±1% was desired; this requires a sample of 2200 items. Dividing the total number of cards (including guide cards) by 2200 gives 477; thus, every 477th card should be drawn. This number was converted to a length in centimeters for ease in actual selection.

5. Binomial distribution is assumed: an item is lost, or it is not.
6. The Catalog Maintenance Unit, which measures in centimeters, made a major shift of the cards in the shelf list based on data collected for this study.

$$\frac{\text{Total number of cards [including guide cards]}}{\text{Sample size needed}} = \text{every Nth card to be drawn}$$

$$\frac{1,050,138}{2200} = 477$$

$$\frac{\text{N, as in every Nth card to be drawn}}{\text{Cards per centimeter}} = \text{distance between samples}$$

$$\frac{477}{38} = 12.6 \text{ cm}$$

Since it proved to be faster to use a pre-cut measuring instrument than to measure with a standard ruler, 1/4" x 1/4" wooden rods were cut to a length of slightly less than 12.6 cm [to assure a sufficiently large sample].

A random point was selected in the first drawer of each of the 16 cabinets housing the Loan Stack shelf list; a card was drawn every 12.6 cm from that position. This process was done twice to obtain the two samples.

While each shelf list card may not represent a single title, the method used will be successful even if such a false assumption is made. When a card was drawn representing more than one volume, all volumes represented were inventoried; when a drawn card was part of a set, all cards in the set were considered as a single card.

Search forms were made by photocopying the pulled cards on a machine with the master searching form in position. An example of this form is shown on page 10.

Two methods were used. When the library was closed to the public, a photocopier was moved to the area of the shelf list. Rods were removed from each drawer. The card at every 12.6cm interval was set on its side, removed, and copied. The verso was examined and photocopied if necessary; if the card was part of a set, all cards in the set were copied, and the copies were stapled together. Cards and rods were then replaced, and the drawers returned to the cabinets. Two people removed the drawers, pulled the rods, measured, and raised the cards. A third person pulled the cards, leaving markers, and photocopied them, then returned the cards to the drawers. After a drawer was completed, the first two people returned it to the cabinet.

When the library was open, a similar method was used, except that cards were removed and replaced by yellow markers. Cards were then taken to a photocopier in another part of the building, photocopied, and refiled under supervision. This method should be avoided if possible: it takes about three times as much labor. Multi-card sets also pose more of a problem when working away from the shelf list. If possible, a copy machine should be moved to the shelf list during the time required to copy the sample.

Cards not yet filed into the shelf list, and cards removed to process materials into storage, were also sampled by the second method above.

LOST SEARCH FORM

A ○ MONOGRAPH ○ SERIAL

○ CSR CHECKED

B [ ] NUMBER OF PHYSICAL VOLUMES FOR THIS TITLE

C ○ ENGLISH

○ NON-ENGLISH

D [ ] NO. OF VOLS. MISSHELVED

DATES SEARCHED

		1			2					3	4				
COPY NO.	NO OF VOL./COPY	MAIN STACKS	TRUCKS on TIERS	SHIFT SHELVES	CURRENT CHARGES CHARGED	CURRENT CHARGES MISSING	ROUTING FILE	DAILY ACTIVITY FILE	ICLFN FILE	4 YRS (4TH TIER) SORTING	HOLD SHELF	RE-TURNS	OTHER	LOCATED YES	LOCATED NO
14															15

Sample Inventories: B. Taking the Inventory

Search forms were analyzed to determine the information for sections A, B, C and D (see page 10). The number of physical volumes was determined from the shelf list card for monographs, and additional copies were included. Serial holdings were checked in the CSR and rotary files. English / non-English was checked. Box D was filled in during the inventory using the following method:

> The correct shelf location for each call number was identified. The number of misshelved volumes within half a shelf on either side of that location was determined and noted; out-of-sequence volume or copy numbers were not counted as misshelving. This process of checking the accuracy on either side of the proper location was also followed for items known to be in ICLF(N), working from the locations the items would be in if they had not been stored.

Search forms were sorted by call number, arranged by shelving tier, and grouped into packets of 15-25 titles. Packets were taken through the entire search process as units, in the order noted on the form. Searchers noted the location of each volume or copy, and the misshelving count for each title, as the search was performed. Only the misshelving count was done for items known (by a stamped number on the shelf list card) to be in ICLF(N).

Missing volumes were searched a second time; several months later, a third search was done. Once searching was complete, the data were coded for further analysis.

Sample Inventories: C. The Collection Model

A model of the collection was developed to determine the extent of book loss due to theft. This model is based on one created in 1973 for use in a university library setting and used in 1975 for the Moffitt theft study. The model assumes that the total number of volumes in the Loan Stack collection, *LS*, is a function of those volumes identified by their relative locations at a point in time:

LS = f(*B*, *M*, *C*, *I*, *S*, *R*, *L*) where

B = number of volumes on shelves in correct locations

M = number of volumes misshelved

C = number of volumes checked out to patrons or known to be missing (as represented by dummy charge cards). Files covered for this element are charge, routing, daily activity, and old faculty.

I = number of volumes in use within the library and not checked out

S = number of volumes stolen

R = number of volumes in storage at Richmond [ICLF(N)]

L = number of volumes in sorting areas, hold and bindery shelves

The function is a linear expression:

LS = *B* + *M* + *C* + *I* + *S* + *R* + *L*

The second and third searches serve to minimize element *I*, and it was treated as effectively equal to zero. The usefulness of additional searches has been reported by Niland & Karth (*CRL*, Mr 15 '76).

The Statistical Package for the Social Sciences (SPSS) was used, running on a CDC 6400 computer. The code book in appendix C is a complete record of the format and variable definitions used. The three sample inventories are coded as subfiles in the SPSS system

file created for the analysis. The file is written on a seven track tape. For an understanding of the SPSS system, the reader is directed to two manuals[7].

---

7. Klecka, William R. et. al., *SPSS Primer*. New York: McGraw-Hill, 1975. Nie, Norman H. et. al., *Statistical Package for the Social Sciences*, 2nd edition, New York: McGraw-Hill, 1975.

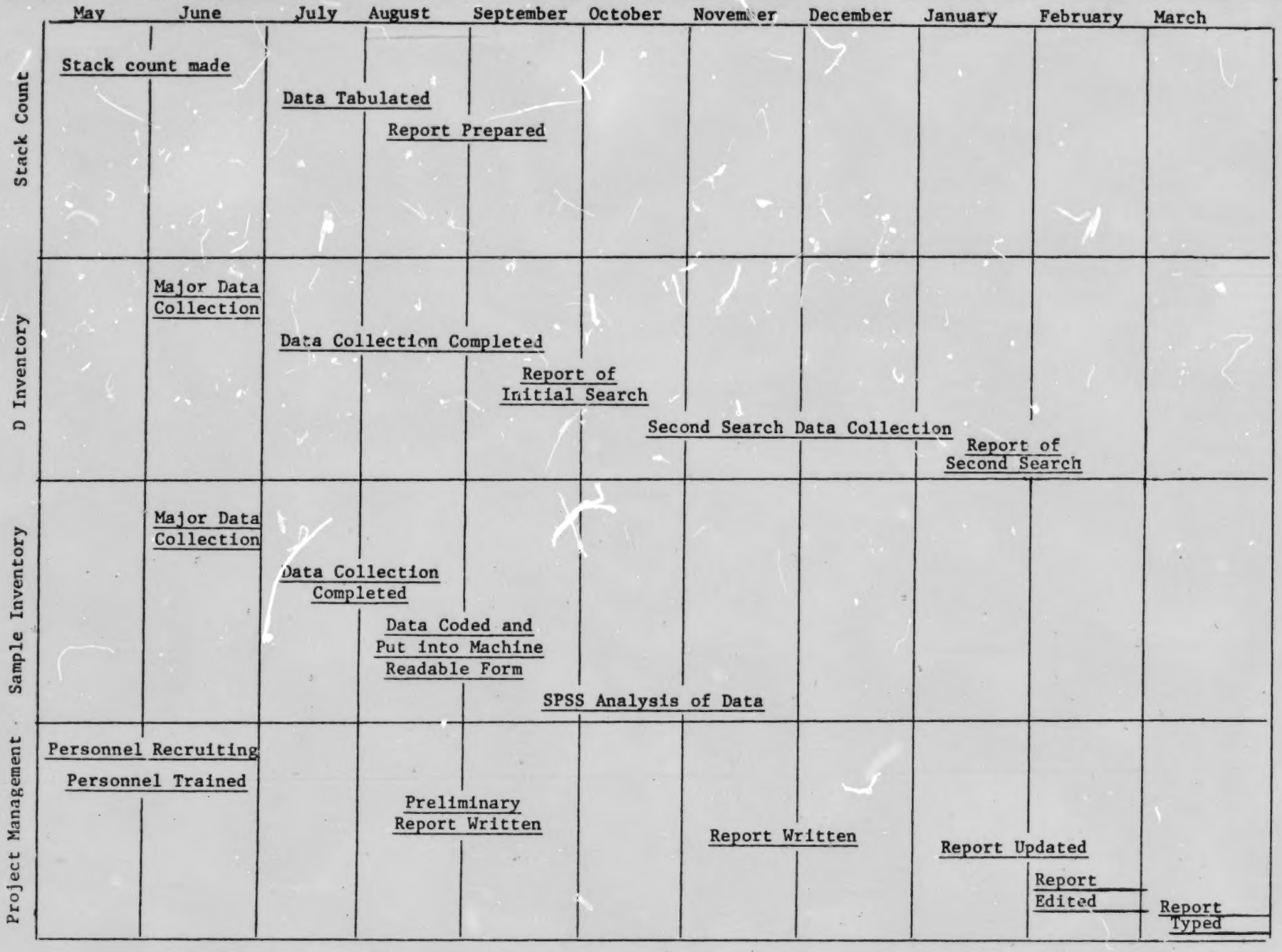
Project Management

The project was managed by Kenneth Legg and Neal Kaske, with Kenneth Legg being responsible for the "D" inventory and stack count, Neal Kaske being responsible for the sample inventories, data analysis, and project report.

Advance planning was limited by time problems. Funds for personnel were to be expended by the end of June 1976 (the end of the fiscal year); 95% of the labor costs were incurred by the end of June. The other 5% was funded from Systems and Circulation Department GA funds. A project calendar is provided on the next page.

The project managers had no model to follow for this study, and had not done a project of this size and complexity; inevitably, there were unforeseen delays. Significant delays were caused by the lack of full serials holding records, the problem of identifying materials without shelf list cards, and first-time use of the SPSS computer system.

Most personnel used in the project were part-time student employees working for Main Library departments or branches. A few people hired directly for the project worked on the stack count. The crew was motivated by the nature of the project and concerned about the problem. Some of the students were finishing MLS degrees and were interested in research. New people were not hired and trained for the project due to 1)lack of time, 2)availability of trained personnel wishing extra work, and 3) the depth of bibliographic knowledge of available student employees.



PROJECT CALENDAR

The "D" Inventory

This portion of the study was initially led by a Library Assistant, but was completed by a Student Library Employee (SLE), who drafted a report giving the exact methodology.

The Stack Count

Five Student Library Employees counted volumes in the stacks; one SLE worked on the ICLF(N) file. The six SLE's were supervised by a Library Assistant from Circulation Department.

The Sample Inventories

More than twenty people took part in this portion of the study. Three crews pulled, photocopied, checked the search forms, and refiled the shelf list cards. Another crew searched materials in the stacks, and a final crew searched the circulation files. These crews were supervised by Laura Spurrier, a Library Assistant in the Graduate Social Science Library

Costs

Costs are estimated below. Some of the project personnel were not paid with money allocated for the study, as the individuals were already working full time for the Library: changing them to the project payroll would have only added to the workload of the Library Business Office.

Computer costs would probably be lower for a second, similar, project, since there is now a base of knowledge on efficient use of the SPSS system.

Management costs and overhead are not included in these figures.

Personnel		Hours
D Inventory	$1,390.90	430
Stack Count	826.07	255
Sample Inventories	2,781.80	860
Subtotal	$4,998.77	1545

Computer costs	
Keypunching	$225.50
Computer time	$400.00
Subtotal	$625.50
Estimated Total	$5,624.27

RESULTS

Volume Count

All volumes in the Loan Stack or charged out were counted during May-June 1976; the ICLF(N) shelf list for Loan Stack items stored was read. This count shows that 1,759,447 volumes were held by Circulation Department as of June 1976. The breakdown by LC classification and other major classifications of the Loan Stack collection is shown on the following page.

This volume count is only useful for assessing theft rate if a second volume count is made during May-June 1977. It is interesting, however, to compare this count with the official Size Tables, which report the Loan Stack collection at 1,963,945 volumes on June 30, 1976. This is 204,498 volumes or 10.4% more than the number shown in the count.[8]

The difference between the two figures may be the result of any or all of these factors:

a) clerical error in preparing either figure or both;

b) changes in method of counting and recording data;

c) theft and other unrecorded loss of material.

There are some volumes left out of the volume count: items removed for technical processing, for photocopy, in carrels, and on tables. The total of these three is thought to be very low, perhaps a thousand. While volumes may have been miscounted, the clerical error should not be more than 3%.

---

8. The 1972 study, *Current Holdings in the Loan Department*, second edition, 1972, Berkeley: General Library, University of California (limited distribution) also showed a volume count significantly lower than the official Size Tables. That total was 1,550,548; naturally, the collection has grown in four years.

Volume Count

LC Class	Volumes Counted	% of LC Collection	% of Total Loan Stack Collection
A	131,846	9.62%	7.49%
B	102,711	7.49	5.84
C	14,016	1.02	.80
D	243,948	17.79	13.87
E	25,645	1.87	1.46
F	48,741	3.56	2.77
G	30,192	2.20	1.72
H	163,867	11.96	9.31
J	42,089	3.07	2.39
K	4,199	.31	.24
L	37,270	2.72	2.12
N	75,844	5.53	4.31
P	255,636	18.65	14.53
Q	70,790	5.16	4.02
R	71	.01	.01
S	25,548	1.86	1.45
T	65,172	4.75	3.70
U	12,395	.90	.70
V	6,138	.45	.35
Z	14,830	1.08	.84
Total LC	1,370,948	100.00%	
Other Classes			
308t	26,741		1.52%
600	6,216		.35
700	42,393		2.41
800	51,900		2.95
900	90,254		5.13
TCP[9]	81,079		4.61
Block Store	89,916		5.11
Total	1,759,447		100.00%

9. Includes X-480's and all TCP designation except those block-stored in ICLF(N)

Data obtained in the shelflist measurements also support the lower figure. The method used there is less accurate than an actual count of volumes. The results, converted to volumes:

$$\left(\frac{1,038,691 \text{ cards}}{1.1 \text{ cards/title}}\right) \times \left(1.8 \text{ volumes/title}\right) = 1,696,403 \text{ volumes}$$

The D inventory showed 453 monograph titles in the stacks without shelf list cards, or 0.87%; extra volumes of serials would also not add cards to the shelf list. Taking this percentage over the entire collection,

1,696,403 vol. x .0087 = 14,759 additional volumes,

giving a total of 1,711,262 volumes: only 2.74% different from the 1,759,447 volumes of the stack count.

This report cannot explain the difference between the Size Tables and actual volume counts. Additional research should be conducted to resolve the difference and obtain a true count for the collection.

D Inventory

Since the collection size for the four D subclasses (D, DA, DB, DT) was not known and time did not allow a full reading of the shelf list, the "compressed cards" method used for the Sample Inventories was also used to estimate the D subclass holdings. This information is necessary to assess rate of loss.

Ten random samples of 100 cards each were taken in each of the four subclasses and counted to determine the card to title ratio: this was found to be 1.11 cards per title. The sample inventories produced volume to title ratios of 1.28 to 1 for monographs and 11.37 to 1 for serials. These figures allowed calculation of estimated size for the LC subclasses, as shown in Figure 1, which also shows approximate losses from each section.

Serials as defined for this study were counted directly. Monographs were not counted directly, but their number can be estimated by subtracting serial holdings from the subclass totals.

Figure 1 shows the results of the initial search process, completed in October 1976. Figure 2 combines the missing figures for the initial search with the results of the second search, completed in February 1977, to arrive at overall loss rates. Note that the overall loss rate was lowered by 0.86% as a result of the second search. The overall loss rate was 1.56%, with a range from 1.06% for the DA's to 2.38% for the DT's.

Monographs	A Estimated total number of cards	B Estimated total titles (1.11) = cards/titles, B = A ÷ 1.11	C Counted Serial Titles	D Estimated number of Monograph titles D = B - C	E Estimated number of Monograph Volumes; 1.28 = Volumes to titles E = D(1.28)	F Physical number of Volumes missing	G Estimated percentage missing G = E ÷ F
D	22,862	20,596	436	20,160	25,805	549	2.13
DA	13,909	12,531	132	12,394	15,871	276	1.74
DB	5,012	4,515	184	4,331	5,544	173	3,12
DT	10,386	9,357	341	9,016	11,540	424	3.67
Total	52,169	46,999	1,093	45,906	58,760	1,422	2.42

Estimated Monograph Losses and Collection Size

Figure 1

Monographs	Estimated number of monographs volumes	Monographs missing after initial search (October 1976)	Percentage missing after initial search (October 1976)	Monographs missing after second search (February 1977)	Percentage missing after second search (February 1977)
D	25,805	549	2.13	376	1.46
DA	15,871	276	1.74	169	1.06
DB	5,544	173	3.12	94	1.70
DT	11,540	424	3.67	275	2.38
Total	58,760	1,422	2.42	914	1.56

Level of Monograph Losses after First and Second Searchs

Figure 2

These figures cover volumes in the shelf list but not locatable. Volumes found on the shelf without shelf list records are considered below.

Misfiled shelf list cards, refiled during the inventory, accounted for 135 of the problem volumes, or 0.25% of the inventory. This left 435 titles, 0.9€%of the total studied. 268 of these were found in the Official shelf list (Figure 3).

Subclass:	D	DA	DB	DT	Total
Number:	99	53	29	87	268

Figure 3: Monograph titles with Official shelf list cards but without Loan Stack shelf list cards

This left 185 titles with no shelf list representation:

Subclass:	D	DA	DB	DT	Total
Number:	95	51	7	32	185

Figure 4: Monograph titles with no shelf list representation

These were studied in detail: the titles were checked in the Main Author/Title catalog, and the call number on card, book, and inside the book were compared. This produced the following results:

Subclass:	D	DA	DB	DT	Total
Number:	37	9	4	7	57

Figure 5: Titles with incorrect call numbers inside and on the spine

Number:	25	8	1	11	45

Figure 6: Titles with incorrect call numbers on the spine only

Number:	3	2	-	3	8

Figure 7: Titles not listed in the Main Author/Title Catalog

Number:	1	-	1	-	2

Figure 8: Titles with temporary cards in the Author/Title Catalog, without current call numbers

Number:	1	1	-	-	2

Figure 9: Titles recorded only in the Main Author/Title Catalog, with matching call numbers.

Subclass:	D	DA	DB	DT	Total
Number:	8	7	-	3	18

Figure 10: Volumes which were missing from the shelf when additional checking was attempted.

Additionally, 53 volumes had difficulties resolved during the checking process; complete data are not available for this group. Approximately 32 of these titles were withdrawn from the collection; 8 belonged to other departments.

Overall percentages for titles lacking shelf list cards are shown in Figure 11. Figure 12 shows estimated figures for incorrectly labelled volumes, but this is only estimated.(The overall estimate for mislabelling translates to 22 mislabelled volumes out of every 10,000 volumes in the collection).

Subclass	Estimated total titles (monographs)	Monograph titles with Official, w/o Loan Stack shelf list cards		Monograph titles without Official or Loan Stack shelf list cards	
		#	%	#	%
D	20,596	99	0.48%	95	0.26%
DA	12,531	53	0.42%	51	0.41%
DB	4,515	29	0.62%	7	0.16%
DT	9,357	87	0.93%	32	0.34%
Total	46,999	268	0.57%	185	0.39%

Figure 11: Titles lacking shelf list cards

Subclass	Estimated total	Mislabelled monograph titles	
D	20,596	62	0.30%
DA	12,531	17	0.14%
DB	4,515	5	0.11%
DT	9,357	18	0.19%
Total	46,999	102	0.22%

Figure 12: Mislabelled monographs

As noted earlier, it was not possible to determine the number of bound volumes properly contained in the collection for all serials. At the end of the initial search, there were some titles for which the records showed more bound volumes than could be located; these titles were reported as having missing volumes. A number of titles also showed volumes present on the shelves which were not recorded as bound. The figures (13 and 14) show titles, not volumes, because records available do not always report the number of physical volumes.

Figure 13: Titles for which volumes are recorded as bound but found missing at the end of each search

Subclass	Number of serial titles	Number of titles involved			
		Initial search		Second search	
D	436	69	15.82%	52	11.93%
DA	132	27	20.45%	21	15.91%
DB	184	16	8.64%	10	5.43%
DT	341	36	10.56%	32	9.34%
Total	1,093	148	13.54%	115	10.52%

Figure 14: Titles with volumes not recorded as bound but present on the shelves

Subclass	Number of serial titles	Number of titles involved	
D	436	54	12.38%
DA	132	30	22.73%
DB	184	23	12.50%
DT	341	57	16.72%
Total	1,093	164	15.00%

These figures show that over 10% of the serial titles studied have volumes missing or improperly recorded, and fifteen percent have incorrect holdings records.

These results do not indicate the percentage of volumes missing from the serial collection; given the available information, it was not possible to develop such figures. The results do point to a problem of misleading and incorrect holdings statements; this is a sizable problem, deserving further study.

In the course of testing a general-purpose selection program, Systems Office was able to provide a count of the four subclasses as represented in the Serials Data Base. Not surprisingly, the results showed a much greater number of serials in each subclass than did the inventory. As noted on Page 6, the inventory took a rather restricted view of "serials" - and, conversely, many multi-volume monographs are included in the Serials Data Base. Figure 15 shows the number of serial titles as defined in the inventory and as counted in the Serials Data Base.

Subclass	Number of titles as defined by the: Inventory	Serials Data Base
D	436	1,285
DA	132	425
DB	185	269
DT	341	711
Total	1,093	4,371

Figure 15: Serial titles as defined and as counted

Sample Inventories

Data collected from these inventories were analyzed using the Statistical Package for the Social Sciences (SPSS). For each title in the samples, a set of variables was collected, as listed in the matrix shown in figure 16. The matrix shows the basic two-dimensional analyses performed using these variables. Each variable is mnemonically coded on the matrix; full definitions will be found in Appendix C, the *LOAD Code Book* to the SPSS file. Additional analyses, which cannot be easily depicted on the matrix, are explained later.

The analyses were performed to determine patterns, if any, in the items missing. Information produced may be useful to other areas of library operations, for instance, storage decisions.

The level of missing books for the three samples ranges from an estimated 2.07% to 4.33%. Sample sizes in titles and volumes with confidence levels and intervals used are shown in figure 17. From this figure it can be seen that, for one hundred trials of each sample, the results would have been between 0.36% and 4.48% for the ILR sample, between 0% and 1.16% for the $LOAT_1$ sample, and between 0% and 1.81% for the $LOAT_2$ sample 95 times out of a hundred. This assumes binomial distribution.

Misshelving estimates for the three samples range from 1.69% to 1.91%, a variation which is within the confidence interval.

The ILR sample shows a sharply higher level of missing books than the other two samples. This sample consists primarily of newer titles. It is frequently postulated that most books are

stolen in the first few years after acquisition. It is also sometimes said that theft is more of a problem today than it was 30 years ago.

A single study cannot really test the first assumption. For a number of reasons, some mentioned below, the second assumption is not directly testable at all. However, it is possible to provide some evidence for one or both assumptions by sorting the data by publication date and into missing / not missing groups. This was done only for monographs; since dates for serials were not recorded on a volume-by-volume basis, no such analysis could be performed.

Date of publication was recorded for all monographs, as was date added to the collection when available. This second date was frequently not available. While accession numbers were assigned until 1955, accession books were not kept after 1912. The practice of stamping the year cataloged did not become consistent until the 1950's. Those items bearing both dates show a strong direct correlation between date of publication and date of accession; therefore, analyses were run based on date of publication.

These dates were grouped into twenty year blocks. The results are shown in figures 18, 19, and 20. While missing percentages vary widely, there is a distinct increase in loss for the last forty years. Most important is the loss level for 1956-1976. After adjusting for misshelving, the estimated percentage is 2.41% for the ILR sample, 2.11% for $LOAT_1$, and 2.20% for $LOAT_2$.

If it can indeed be assumed that materials are stolen while relatively new, then figures 19 and 20 do support the assumption of an upward trend of theft. However, the study could not take into account volumes stolen many years ago and long since replaced. The misshelving factor must also be considered: if, as is also normally assumed, recent books circulate far more actively, they will tend to be misshelved more often. Taking these factors into account, the upward trend may not be as clear as it appears from the figures alone.

All cases, All subfiles	LCCLASS	PUBDATE (20 yr. block)	YEARSUC	MONOGRAF	PHYSVOL	ENGLISH	MISSHELF	STACKS	CHARGE	ICLFN	OTHER	MISSING	TIMELAG	REALPUB
LCCLASS	HF			C		C	B		C	C		C		B
PUBDATE (20 yr. block)		H			C				C	C		C		
YEARSUC			HF									C		S
MONOGRAF				HF	C		C		C	C		C		
PHYSVOL					HF	C								
ENGLISH						HF	C		C	C		C		
MISSHELF							HF							
STACKS								HF						
CHARGE									HF					
ICLFN										HF				
OTHER											HF			
MISSING												HF		C
TIMELAG													HF	
REALPUB														HF

F = frequency

H = histogram (with condensed format frequency)

S = scattergram

C = crosstabs

B = breakdown

Matrix of Variables and Analysis

Figure 16

Sample	Sample Size in Titles	Sample Size in Volumes	Confidence Level (the number of times out of 100 one expects to obtain the same results	Confidence Interval	Estimated Percentage Missing	Estimated Percentage Misshelved	Estimated Percentage Stolen (G = E - F)	Range of Percentage Stolen (G ± D)
ILR	520	809	95%	± 2.06%	4.33	1.91	2.42	0.36 to 4.4
$LOAT_1$	2,247	4,150	95%	± 0.91%	2.07	1.82	0.25	0.00 to 1.1
$LOAT_2$	2,256	3,947	95%	± 0.94%	2.56	1.69	0.85	0.00 to 1.8

Estimated Levels of Missing Materials

Figure 17

Time Periods* / Data Groups / Dates	1 1592-1615	6 1696-1715	11 1796-1815	12 1816-1835	13 1836-1855	14 1856-1875	15 1876-1895	16 1896-1915	17 1916-1935	18 1936-1955	19 1956-1976
A. Number of Physical Volumes			1					21	17	19	463
B. Number of Physical Volumes Missing			1					8	2	1	20
C. C = B ÷ A			100					38.10	11.76	5.26	4.32
D. D = B ÷ Total volumes in the sample			0.12					0.98	0.25	0.12	2.46
E. **Cumulative Percentage of Volumes Missing up to and including this time period			100					20.93	18.33	15.19	5.90

* Time periods with no missing volumes were omitted from this chart. The number of samples, however, were used in these calculations

** E = All volumes missing through that date ÷ all volumes sampled through that date

Sample ILR

Figure 18

Time Periods* / Data Groups / Dates	1 1592-1615	6 1696-1715	11 1796-1815	12 1816-1835	13 1836-1855	14 1856-1875	15 1876-1895	16 1896-1915	17 1916-1935	18 1936-1955	19 1956-1976
A. Number of Physical Volumes	2			41		74	179	556	459	544	788
B. Number of Physical Volumes Missing	1			6		2	2	7	10	17	31
C. C = B ÷ A	50.00			14.63		2.70	1.12	1.26	2.18	3.13	3.93
D. D = B ÷ Total volumes in the sample	0.02			0.14		0.05	0.05	0.17	0.24	0.41	0.75
E. **Cumulative Percentage of Volumes Missing up to and including this time period	50.00			4.64		2.86	2.23	1.71	1.86	2.19	2.68

* Time periods with no missing volumes were omitted from this chart. The number of samples, however, were used in these calculations

** E = All volumes missing through that date ÷ all volumes sampled through that date

Sample LOAT 1

Figure 19

Time Periods* / Data Groups / Dates	1	6	11	12	13	14	15	16	17	18	19
	1592-1615	1696-1715	1796-1815	1816-1835	1836-1855	1856-1875	1876-1895	1896-1915	1916-1935	1936-1955	1956-1976
A. Number of Physical Volumes		6	48	56	63	78	180	274	414	570	849
B. Number of Physical Volumes Missing		1	1	2	5	4	5	8	5	10	33
C. C = B ÷ A		16.67	2.08	3.57	7.94	5.13	2.78	2.92	1.21	1.75	3.89
D. D = B ÷ Total volumes in the sample		0.03	0.03	0.05	0.13	0.10	0.13	0.20	0.13	0.25	0.84
E. **Cumulative Percentage of Volumes Missing up to and including this time period		3.33	1.57	2.19	3.66	4.01	3.57	3.34	2.60	2.33	2.83

* Time periods with no missing volumes were omitted from this chart. The number of samples, however, were used in these calculations

** E = All volumes missing through that date ÷ all volumes sampled through that date

Sample $LOAT_2$

Figure 20

A further analysis was performed, calculating the percentage of each sample published during the last twenty years, and the percentage of missing volumes published during the last twenty years. The ILR sample is not shown here: since it represents only items added to the collection since 1968, all loss must have occurred during the last twenty years, and the very high numbers are thus meaningless as historical perspective.

	Percentage published 1956-1976	Percentage missing published 1956-1976
$LOAT_1$	18.98%	36.05%
$LOAT_2$	21.52%	32.67%

These figures also suggest that theft is a greater problem today than in the past.

This study cannot show the reasons for an increased theft rate, if such an increase exists. It is possible to consider and, to some extent, eliminate one reason which has been posited for increased theft. This is the argument that there are more students, fewer books per student, thus more theft. This may be a factor in some institutions. However, Berkeley reached its full enrollment capacity fourteen years ago. The chart on page 36 shows collection size, student enrollment, and volumes per student for the last thirty years. Given steady enrollment and increased acquisitions, there are clearly more volumes per student now than in the past. (This table does not relate directly to the other tables, since full capacity was only reached within the most recent 20-year period).

YEARS	COLLECTION	ENROLLMENT	VOLUME PER STUDENT
1945-6	1,142,210	19,496	58.59
6-7	1,291,926	29,525	43.76
7-8	1,422,547	29,424	48.35
8-9	1,506,004	30,182	49.90
49-50	1,539,612	30,200	50.98
50-1	1,614,404	22,346	48.76
1-2	1,674,078	18,843	62.07
2-3	1,728,761	18,075	71.40
3-4	1,793,460	17,363	76.07
4-5	1,859,715	18,106	75.15
5-6	1,927,303	19,176	72.88
6-7	2,002,432	20,039	73.00
7-8	2,072,854	21,013	73.58
8-9	2,156,082	21,333	74.74
59-60	2,251,791	21,939	76.09
60-1	2,334,386	23,974	73.86
1-2	2,432,205	25,946	71.79
2-3	2,549,606	27,470	70.65
3-4	2,669,000	29,407	69.50
4-5	2,793,271	30,032	70.70
5-6	2,915,203	29,476	75.30
6-7	3,046,498	29,417	78.84
7-8	3,183,043	28,863	88.41
8-9	3,319,484	28,132	90.36
69-70	3,512,981	28,088	92.38
70-1	3,663,070	28,525	101.30
1-2	3,791,670	27,712	104.17
2-3	3,908,535	28,483	107.65
3-4	4,038,398	29,909	107.88
4-5	4,157,112	29,730	117.25
5-6	4,274,949		

The Dollar Value of the Losses:

If one makes the assumption that the level of loss due to theft stays around 2%, what then is the dollar value of this loss per each 1,000 volumes added to the collection? With an estimated cost of $30.00 per volume ($15.00 for the volume and $15.00 for processing), a 2% loss would cost $600.00 for each 1,000 books added. Assuming these losses all come during the first year the book was available, that the no losses occurred after that time, and that 40,000 volumes were being added annually, the dollar loss each year would be $24,000.00 ($600.00 x 40). If the loss level was at 4% (the level of the ILR sample) the dollar loss each year would be $48,000.00.

A Sample of Expressed Demand:

The Cooperative Services Department has kept records of its work load for the past three years. Within their records there are data on the number of items that they were unable to locate because the materials were missing. These data are presented in Figure 21.

	November 1973 - June 1974	1974-1975	1975-1976	July - December 1976
Total Requests Processed	7,005	15,377	12,593	17,733
Total Declared Missing	97	371	221	166
Percentage Missing	1.38	2.41	1.75	0.94

Cooperative Services Missing Books Data

Figure 21

It must be noted that the Cooperative Services Department's data represent materials requested by faculty and staff. The materials are needed. It can be called a sample of the expressed demand placed upon the General Library for materials. The materials may or may not be housed in the Main Stack collection.

The management staff of Cooperative Services estimates that 90% of the materials they find declared missing are materials that are housed in the Main Stack's collection. The staff also estimates that only 60% of their meterials they obtain come from the Main Stack collection. With these two assumptions about materials Cooperative Services obtains (90% of the declared missing are from Main Stacks and 60% of the materials requested are housed in the Main Stacks) applied to the data collected by

the Cooperative Services Department are very similar to the ones for both the sample inventory and the "D" inventory. It is recommended that the percentage be added to the Cooperatives Services Department's "Workload Statistics Report" because it seems to be a good estimation of the losses as they relate to expressed demand. The added information can be presented at little or no additional costs to the Library, too.

	November 1973 - June 1974	1974-1975	1975-1976	July - December 1976
Total Requests Processed	7,005	15,377	12,593	17,733
60% of total Requests Processed (.6 x 4) = B	4,203	9,226	7,556	10,640
Total Declared Missing	97	371	221	166
90% of total Declared Missing (.9 x C) = D	83.3	339.9	198.9	149.4
Estimated Percentage Missing Making the above assumption (D ÷ B) = C	2.08	3.62	2.63	1.40

Estimated Theft Level of Materials Requested Through Cooperative Services

Figure 22

Collection Profile:

The sample inventory process collected considerable data that can provide information on things other than the level of theft. In the process of search for each volume, its location was noted. With these data, it is possible to profile the collection as to the percentage of the collection 1) in the stacks, 2) in circulation, 3) in storage, and 4) missing from the collection. For each of these four areas, the data are presented below in Figure 23.

Sample	Percentage in the stacks	Percentage in Circulation	Percentage in Storage	Percentage Missing
ILR	84.50	5.66	5.41	4.43
$LOAT_1$	64.88	4.07	28.98	2.07
$LOAT_2$	71.90	4.66	20.96	2.48

Collection Profile

Figure 23

These percentages all seem to reflect the expected real situation. For example, it is expected that newer items would not be in storage. The value for items in storage in the ILR sample (this sample is mainly new materials -- last ten years) is 5.41%, where the average for the other two samples is around 25.0%. The level for items in circulation is lower for the two larger samples because they are not of just current materials and the percentages for the levels of loss are also lower. It is expected that newer materials are used more and are more likely to be stolen.

Looking now to the other variables noted, the reader is directed to three figures 24-26. These figures represent additional information on the collection housed in the Main Stacks. The information presented

requires careful study. No conclusions are made using this additional information because it is out of the scope of this report. The data, however, are believed to be a useful byproduct of this study. It is hoped that the information can be used by collection managers in the areas of collection development and storage selection.

ILR Classification	Number of titles	% of titles	Misshelving (by title searched)	Number of volumes	% of volumes	% of volumes in English in each class	% of volumes Monographs	Mean publication data of Monographs	% of volumes in stacks	% of volumes charged	% of volumes at ICLF-N	% of volumes missing
A	20	3.86		25	3.08	0	76.0	1964	14 56.00	0	10 40.00	1 4.00
B	37	7.13		38	4.67	42.1	100.0	1960	31 81.58	2 5.26	4 10.53	1 2.63
C	9	1.73		9	1.11	44.4	100.0	1964	5 55.56	2 22.22	1 11.11	1 11.11
D	83	15.96		263	32.35	21.3	32.3	1954	242 92.02	13 4.94	1 0.38	7 2.66
E-F	22	4.23		24	2.95	54.2	91.7	1966	21 87.50	2 8.33	0	1 4.17
G	14	2.69		16	1.97	37.5	100.0	1967	14 87.50	2 12.50	0	0
H	50	9.62		78	9.59	42.3	59.0	1967	62 79.49	5 6.41	10 12.82	1 1.28
J	16	3.08		16	1.97	68.8	100.0	1967	14 87.50	0	0	2 12.50
K	2	0.38		2	0.25	0	100.0	1963	2 100.00	0	0	0
L	5	0.96		6	0.74	33.3	50.0	1960	2 33.33	0	4 66.67	0
N	28	5.38		34	4.18	17.6	100.0	1951	27 79.41	5 14.71	0	2 5.88
P	162	31.15		199	24.48	34.2	90.5	1950	169 84.93	13 6.53	4 2.01	13 6.53
Q	14	2.69		30	3.69	26.7	53.3	1954	28 93.34	1 3.33	0	1 3.33
S	1	0.19		5	0.62	0	0	0	0 0	0	5 100.00	0
T	6	1.15		6	0.74	100.00	83.3	1965	2 33.33	0	3 50.00	1 16.67
U-V	6	1.15		17	2.09	94.1	29.4	1953	14 82.36	1 5.88	1 5.88	1 5.88
X-Z	22	4.23		22	2.70	86.4	100.0	1967	17 77.27	0	1 4.55	4 18.18
308t	22	4.23		22	2.70	95.5	100.0	1969	22 100.00	0	0	0
600s 700s	0	--		--	--	--	--	--	--	--	--	--
800	0	--		--	--	--	--	--	--	--	--	--
900	1	0.19		1	0.12	100.0	100.0	1969	1 100.00	0	0	0
TOTALS	520	100.00		813	100.00	--	--	1957	84.50	5.66	5.41	4.43
								Mean for entire sample	687/813	46/813	44/813	36/813

FIGURE 24

Note: 1v. "other" LC 12 added to "STACK"

LOAT 1

Classification	Number of titles	% of titles	Misshelving (by title searched)	Number of volumes	% of volumes	% of volumes in English in each class	% of volumes Monographs	Mean publication data of Monographs	% of volumes in stacks	% of volumes charged	% of volumes at ICLF-N	% of volumes missing
A	23	1.02		252	6.07	13.1	5.2	1915	152 60.32	7 2.78	93 36.90	--
B	172	7.65		324	6.12	42.9	88.2	1921	233 71.92	15 4.63	64 19.75	12 3.70
C	21	0.93		30	0.71	36.7	100.0	1942	28 93.33	--	2 6.67	--
D	343	15.26		610	14.72	28.7	78.9	1900	473 77.54	21 3.44	110 18.04	6 0.98
E-F	123	5.47		205	4.94	74.6	67,3	1934	169 81.46	10 4.88	23 11.22	5 2.44
G	38	1.69		59	1.42	57.6	64.4	1925	48 81.36	5 8.48	3 5.08	3 5.08
H	225	10.02		301	7.25	55.5	77.7	1939	165 55.81	19 6.31	100 35.22	8 2.66
J	91	4.05		114	2.75	58.8	80.7	1937	84 73.68	6 5.26	22 19.31	2 1.75
K	5	0.22		30	0.71	6.7	13.3	1965	30 100.00	--	--	--
L	51	2.27		240	5.78	69.6	32.1	1928	7 2.91	4 1.67	226 94.17	3 1.25
N	96	4.27		139	3.35	36.0	74.8	1941	100 71.94	17 12.23	20 14.39	2 1.44
P	448	19.94		551	13.27	20.7	95.8	1940	445 81.30	45 8.17	39 7.08	19 3.45
Q	66	2.94		342	9.93	62.9	62.9	1903	321 77.90	4 0.97	14 3.40	3 0.73
S	31	1.38		96	2.31	50.0	28.1	1910	0 --	--	96 100.00	--
T	59	2.63		201	4.84	94.5	27.9	1926	18 8.95	--	181 90.05	2 1.00
U-V	23	1.02		64	1.54	18.8	35.9	1933	51 79.69	--	13 20.31	--
X-Z	20	0.89		82	1.98	22.0	23.2	1907	30 36.58	2 2.44	49 59.76	1 1.22
308t	64	2.85		62	1.49	96.8	100.0	*	61 98.39	--	--	1 1.61
600s 700s	81	3.61		104	2.51	22.1	89.4	1896	56 53.85	8 7.69	34 32.69	6 5.77
800	81	3.61		96	2.31	25.0	99.0	1902	69 71.88	1 1.04	24 25.00	2 2.08
900	186	8.28		249	6.00	94.8	100.0	1906	149 59.84	5 2.01	84 33.73	11 4.42
TOTALS	2247	100.00		4151	100.00	--	--		64.88	4.07	28.98	2.07
								Mean for entire sample	2693/4151	199/4151	1203/4151	86/4151

FIGURE 25

* data incomplete.
no "OTHERS"

LOAT 2

Classification	Number of titles	% of titles	Misshelving (by title searched)	Number of volumes	% of volumes	% of volumes in English in each class	% of volumes Monographs	Mean publication data of Monographs	% of volumes in stacks	% of volumes charged	% of volumes at ICLF-N	% of volumes missing
A	23	1.02		121	3.07	52.1	19.8	1872	107 88.43	2 1.65	9 7.44	3 2.48
B	171	7.59		401	10.16	27.9	48.1	1924	296 73.82	17 4.24	77 19.20	11 2.74
C	21	0.93		32	0.81	46.9	78.1	1940	27 84.38	15 15.62	0 --	0 --
D	340	15.08		608	15.41	37.0	65.1	1917	513 84.38	19 3.12	67 11.02	9 1.48
E-F	125	5.55		147	3.73	65.3	96.6	1926	109 74.15	12 8.16	20 13.61	6 4.08
G	38	1.69		154	3.90	40.3	28.6	1926	147 95.45	2 1.30	4 2.60	1 0.65
H	239	10.60		426	10.80	55.6	64.6	1946	257 60.33	23 5.40	131 30.75	15 3.52
J	74	3.28		173	4.38	61.6	55.5	1916	137 79.19	4 2.31	29 16.76	3 1.74
K	6	0.27		48	1.22	4.2	16.7	1952	27 56.25	0 --	20 41.67	1 2.08
L	48	2.13		86	2.18	43.0	57.0	1923	8 9.30	0 --	78 90.70	0 --
N	97	4.30		110	2.79	38.2	94.5	1939	92 83.64	12 10.90	3 2.73	3 2.73
P	457	20.28		705	17.87	17.0	77.7	1933	569 80.71	58 8.23	56 7.94	22 3.12
Q	70	3.11		150	3.80	44.0	50.7	1917	118 78.67	9 6.00	17 11.33	6 4.00
S	30	1.33		43	1.09	65.1	67.4	1929	0 --	0 --	43 100.00	0 --
T	58	2.57		139	3.52	89.2	39.6	1927	40 28.78	2 1.44	97 69.78	0 --
U-V	21	0.93		49	1.24	79.6	34.7	1941	9 18.37	1 2.04	35 71.43	4 8.16
X-Z	24	1.06		30	0.76	43.3	93.3	1925	22 73.34	0 --	7 23.33	1 3.33
308t	66	2.93		66	1.67	97.0	100.0	*	66 100.0	0 --	0 --	0 --
600s 700s	83	3.68		101	2.56	15.8	100.0	1889	68 67.33	4 3.96	22 21.78	7 6.93
800's	79	3.50		138	3.50	24.6	90.6	1889	101 73.19	4 2.90	33 23.91	0 --
900s	184	8.17		219	5.54	94.5	99.1	1910	124 56.62	10 4.57	79 36.07	6 2.74
TOTALS	2254	100.00		3946	100.00	--	--		71.90	4.66	20.96	2.48
								Mean for entire sample.	2837/3946	184/3946	827/3946	98/3946

FIGURE 26

* Bad data. "OTHER"'s added to "STACKS" (1 each in 7 CL Classes)

SUMMARY AND RECOMMENDATIONS

This study was designed to determine the level of theft for materials housed in the Loan Stack collection. The study was divided into three major parts. The first, a volume count, requires that two counts of the collection be made a year apart. One of the counts was made within the project. It is recommended that the second count be done in May-June 1977, to provide further information on loss levels.

In doing the second count, a number of changes should be made in the methodology:

1. Data should be recorded in smaller units. The units used in *Current Holdings in the Loan Department* will provide more information and provide a long-term picture of changes in the collection.

2. All units should be asked to return materials removed from the collection but not checked out.

3. The staff should be asked not to remove volumes from the Loan Stacks without charging them, during the period of the count.

These changes should make the collection of data more precise. Only when this recount is done and the results are compared with the Size Tables can conclusive judgements be made regarding this method of loss measurement.

The second part of the study was an inventory of subclass "DA", "DB,", "D" and "DT" materials. On an average, 1.56%of the materials in this area are missing and apparently stolen. By subclass, the percentage missing after a second search is:

D: 1.46%; DA: 1.06%; DB: 1.70%; DT: 2.38%.

It is recommended that the "D" inventory be completed, and that a rolling inventory be carried on as a normal task within the Circulation Department. This process can uncover and take care of a wide variety of bibliographic problems, thus increasing access to the collection.

The third part of the study used sample inventories. Results of these inventories show that losses due to theft could range as high as 4.48%, depending on assumptions. While the more likely theft rate appears to be much lower, the study does show strong evidence of an increasing rate of theft.

It is recommended that materials added within the last five years and fully cataloged be studied to determine the level of theft. Based on this study, it is believed that losses are greatest in this area, and that losses may represent a dollar value equal to or greater than the cost of additional security for the collection.

The study also gives much additional information on the condition, use, and location of the collection. This information should be useful for collection development and storage. It is recommended that the quality of serials holdings records be studied further, to see how representative these records are of serials actually held.

This study provides much information for management, in the areas of security, bibliographic representation, and collection development. The data collected in the sample inventories are available in machine-readable form for others doing research on the Loan Stack; the code book is presented in Appendix C.

APPENDICES

Appendix A: Results of Loan Department Service Survey

Appendix B: Draft Proposal

Appendix C: LOAT Code Book

RESULTS OF LOAN DEPARTMENT SERVICE SURVEY, WINTER [illegible]

12 weeks

	NO.	NO.	NO.	NO.	% of Total	% of Unfilled	
Total requests				141,779	100.00	--	(1)
Total filled			106,742		75.29	--	(2)
Filled at time of request		96,143			(67.81)	--	(3)
Filled later		10,599			(7.47)	--	(4)
Recalls	6,904				(4.87)	--	(5)
ICLP(N)	3,695				(2.61)	--	(6)
Total not filled			35,037		24.71	100.00	(7)
Out to another borrower		16,313			11.50	46.56	(8)
Faculty	2,830				(2.00)	(8.08)	(9)
Other	13,483				(9.51)	(38.48)	(10)
Departmental charges					2.78	11.23	(11)
RBR	2,834[a]	3,936			(2.00)	(8.09)	(12)
Branches, HGS, etc.	1,102[a]				(0.78)	(3.14)	(13)
Incorrect information		3,909			2.76	11.16	(14)
On shelf when searched		3,275			2.31	9.35	(15)
From Loan Desk	819[b]				(0.58)	(2.34)	(16)
From stack info. desk	2,456[b]				(1.73)	(7.01)	(17)
Missing or lost		2,394			1.69	6.83	(18)
Missing	1,487				(1.05)	(4.24)	(19)
Lost	907				(0.64)	(2.59)	(20)
ICLP(N)		1,734			1.22	4.95	(21)
Report given, not paged	37				(0.02)	(0.11)	(22)
No report to patron	1,697				(1.20)	(4.84)	(23)
No such book		816			0.57	2.33	(24)
Misshelved		776			0.55	2.21	(25)
On hold shelf		567			0.40	1.62	(26)
Bindery or cataloging		403			0.28	1.15	(27)
Bindery	383[c]				(0.26)	(1.09)	(28)
Cataloging	20[c]				(0.02)	(0.06)	(29)
Int. Lib. Lndg. or Lib. Photo. Service		294			0.21	0.84	(30)
ILL	265[d]				(0.19)	(0.76)	(31)
LPS	29[d]				(0.02)	(0.08)	(32)
Tubs on tier		258			0.18	0.74	(33)
Out to same borrower		238			0.17	0.68	(34)
Fourth tier returns		124			0.09	0.35	(35)

a. Distribution projected from estimated total RBR and other departmental charges.
b. Based on estimated distribution of source of request.
c. Based on sample of 246 instances, of which 236 were bindery.
d. Based on sample, of which 90% were ILL.

Appendix B

A DRAFT PROPOSAL TO MEASURE THE LEVEL
OF THEFT FROM THE MAIN STACKS OF THE DOE LIBRARY

by
Neal Kaske and Kenneth Legg

Problem Statement:

At this time the level of loss of Library materials (books and journals) is not known for the Main Stack of the Doe Library. The last complete inventory was believed to have been done sometime during the 1940's. Currently the only substantiated information known about losses from this collection are provided by the reports produced as a result of the work done by the Acquisition Department in the area of replacements. A person in that department does a complete search for materials reported to be missing from the Main Stacks and then contacts selectors regarding the question of reorder. This search by the Acquisition Department comes after the routine "search" process has been completed by the Circulation Department, which is made up of four complete searches for the book. From the report issued by the person doing this work the following is learned:

	Oct-Jun 1973-74	Jul-Jun 1974-75	Jul-Mar 1975-76
Number of Replacement copies ordered[1]	928	1,369	1,338
Number of Copies Withdrawn[2]	355	391	438
Total number of copies	1,283	1,760	1,776
Estimated loss in dollars[3]	$25,660	$35,200	$35,520

The opinions of individuals who work within and outside of the Circulation Department vary a great deal as to level of losses of materials due to theft from the main stacks. All agree that there is a need for evidence as

to the level of loss so plans regarding the security of materials can take place on an informed basis. Therefore, a study to assess the level of loss of Library materials from the main stacks of the Doe Library is called for at this time.

Methodology:

To do an inventory (sample or total) of this collection with the precision required in assessing the level of loss is very difficult because the exact size of the collection is not known. A study[4] was done four years ago which assessed the size of the collection as to the number of physical volumes held by the Circulation Department. This study, however, did not note which volumes were missing or, for that matter, if any volumes were missing. These data as to the size of the collection (in volumes) could be used with the Catalog Department's data on the estimated number of cards filed into the main stack shelflist (over the past four years) to provide an approximation of the collection size. These combined data could then be used as an estimate of the collection size for the main stack collection.

In light of the lack of precision in the measurement of the collection size, three different studies are proposed. These studies are independent of each other but are put forward here as a group because they should provide the most useful information at the least cost on the subject of book losses from the main stack collection.

The first study proposed is a complete inventory of the "D" (History) class of materials. This section of the collection is suggested because it is held only by the Circulation Department and it is a class of materials which seem to receive an average or above average level of use and therefore the findings may be generalized. The size of this subcollection is estimated to be between 225,000 and 250,000 volumes. The cost of the inventory would be between $15,750 and $17,500 if the inventory was done at an average rate of 50 volumes per hour with a wage scale of $3.50 per hour for the total man hours of the project.

It should be noted that as a direct result of the inventory an additional work load would be put upon the Catalog Department. This work load would be in the form of updating the shelflist records to reflect the findings of the problems during the course of the inventory (such as - call numbers on cards and books not agreeing). No estimate of the size of additional work load is given but one might expect that at least 3% to 5% of the records (6,750-12,500) would require some attention.

The second proposed study is a two-stage volume count of the total holding with the Circulation Department. The first stage of this study would be to determine the number of volumes currently held by the Circulation Department. The methodology would be basically the same as that used in the 1972 study (see note 4). The method would be to count the volumes on the shelves, checked out and in storage. The second stage would be to record the number of volumes added to/and withdrawn from the collection over the next fiscal year. The final stage would be to repeat the first stage and assess the difference between the two counts.

The cost for this study is estimated to be between $2,800 and $3,500. The assumption is that it will take between 400 and 500 hours to do stages one and three and that the average pay would be $3.50 per hour. It is also assumed that stage two would be absorbed by the normal processing of materials for the Circulation Department: the counting of the new volumes added to the Circulation Department and those volumes withdrawn would be assimilated into the work loads of the Catalog Department and/or the Circulation Department.

The third study proposed is a sample inventory of materials added to the collection during a set period of time. It is believed that the sample drawn and used by the Institute of Library Research in doing their planning study for UCUCS-2[5] could be used for this proposed sample inventory. The sample drawn has been given limited examination by the authors of this proposal. Based upon this examination a brief statistical check is recommended to assure that the

part of the sample which is of Circulation Department materials is representative of the main stack collection. The sample drawn for the Institute's study was taken from the population of all catalog cards sent to the Institute from the General Library as well as the Law Library. This sample may not be representative of the items placed in the Circulation Department during this time period.

The cost of this third study is estimated to be between $1,500 and $2,000 using the sample drawn by the Institute. The information found would be at the confidence level of 95% and at the confidence interval of ± 3%. If the sample drawn by the Institute should prove not to be representative then the cost of this study would just about double ($3,000 to $4,000) but the results would be at a higher precision level (confidence level 95% with a confidence interval of ± 2%).

Budget:

The cost estimates of the three proposed studies are listed below:

Study 1	$15,750	-	$17,500	
Study 2	2,800	-	3,500	
Study 3	1,500		2,000	
or	3,000	-	4,000	
T O T A L	$20,050	-	$23,000	
or	21,550	-	or 25,000	

The costs for the design, management, and reporting of the findings are not part of these estimates. These costs are assumed to be absorbed by the management personnel in the Circulation Department and the personnel assigned to work on the project from the Library Systems Office.

Expected Information Results:

The expected informational results of the three proposed studies are outlined below:

Study 1: The total number of volumes missing from the subcollection studied (History - non-U.S.). Excellent cost estimates on making a complete inventory of the total main stack collection. Some information on the type and frequency of errors made in the main stack shelflist.

Study 2: The number of volumes lost over a period of one year. It is noted that some of the books stolen the year or years before would be returned during the year of the study but it is also assumed that additional volumes will be stolen, thus, the level of loss should stay somewhat the same if the loss rate is the same. Excellent cost estimates on making this type of study again and/or in the branch libraries would be learned.

Study 3: An estimate of the number of volumes stolen from the collection that were added during the years 1968 and 1972 could be learned. A good cost estimate on performing a sample inventory of the toal main stack collection could be made by the data collected during this study.

Areas for Additional Study and/or Management Decisions:

Determination of what to do with the findings once they are made by these studies or, what could the Library do if the theft level to be unacceptable? A plan of action?

Footnotes:

[1]These are the books which were reordered by the Acquisition Department, often proof was established that the books were missing and a selector made the decision to replace the items.

[2]Proof was established that these books were missing but the selectors did not request that the book be replaced at this time.

[3]An estimate of $20.00 per copy has been used to place a dollar value on these losses. The cost of processing is not part of this estimate.

[4]Current Holdings in the Loan Department. Second Edition - August 1972. General Library, University of California, Berkeley.

[5]Bourne, Charles P. Planning for the Conversion of UCUCS-2 Catalog Card Records Into Machine Readable Form. Berkeley, California: Institute of Library Research, January, 1976.

Appendix C

LOAT CODE BOOK

SPSS SYSTEM TAPE FORM

Set up in 3 subfiles: ILR, SONE, STWO

Variable Name	Variable Description and Code
TITLENUM	Identifying number for each title
LCLETTR	First two LC Letters of call number (numbers in case of Rowells)
LCCLASS	LC Classification by following code:

1 = A
2 = B
3 = C
4 = D
5 = E - F
6 = G
7 = H
8 = J
9 = K
10 = L
11 = N
12 = P
13 = Q
14 = S
15 = T
16 = U - V
17 = X - Z, 4 -
18 = 308t
19 = Rowell 600 and 700's
20 = Rowell 800's
21 = Rowell 900's

Variable Name	Variable Description and Code
PUBDATE	Publication dates grouped in 20 year blocks by the following code: 1 = 1592 -1615 2 = 1616 - 1635 3 = 1636 - 1655 4 = 1656 - 1675 5 = 1676 - 1695 6 = 1696 - 1715 7 = 1716 - 1735 8 = 1736 - 1755 9 = 1756 - 1775 10 = 1776 - 1795 11 = 1796 - 1815 12 = 1816 - 1835 13 = 1836 - 1855 14 = 1856 - 1875 15 = 1876 - 1895 16 = 1896 - 1915 17 = 1916 - 1935 18 = 1936 - 1955 19 = 1956 - 1976 Missing value: 0 = Serials (also where no date at all given)
YEARSUC	Number of years in UC collection (exact value) Missing Values: 0 = Serials 998 = 1913 - 1955 publication (Accession numbers 220,000 trough M Series) 999 = 1956 to present (3 digit accession numbers now in use)
MONOGRAF	Type of publication 0 = Monograph 2 = Serial

Variable Name	Variable Description and Code
PHYSVOL	Number of physical volumes searched for per title (exact value) Missing value: 999 = Unbound
ENGLISH	In English or foreign language? 0 = Non-English 1 = English
MISSHELF	Number of misshelved volumes found on full shelf (exact value) Missing values: 98 = Richmond block storage 99 = Unbound theses
STACKS	Number of volumes per title found on shelves, including shift shelves (exact value)
CHARGE	Number of volumes per title found in charge file, daily activities file, old faculty charge file (exact value)
ICLFN	Number of volumes per title stored in Richmond (exact value)
OTHER	Number of volumes per title found on trucks, 4th tier sorting area, hold shelf, bindery shelf (exact value)
MISSING	Number of volumes per title NOT found (exact value)
TIMELAG	Number of years from publication date to arrival in UC Collection, computed by: Timelag = (976 - Pubdate) - Years UC Missing value: - 1 = Insufficient data
REALPUB	Last 3 numbers of publication date Missing values: 0 = Serials (also where no date at all given)